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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,886	08/06/2003	Tsutomu Asakawa	Q76840	7540

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EXAMINER

VERSTEEG, STEVEN H

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 08/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/634,886

Applicant(s)

ASAKAWA ET AL.

Examiner

Steven H. VerSteeg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 17-20 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8 is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/11/05 & 7/29/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Newly submitted claims 17-20 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the dust proof substrate can be made by a materially different process such as ion plating

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 17-20 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Objections

2. Claim 5 is objected to because of the following informalities: "medium" should be "low" in line 3 (it was correct in the original claim). Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-7, and 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-188103 (JP '103) in view of US 2003/0228431 A1 to Krisko et al. (Krisko).
5. For claim 1, Applicant requires a method of producing an antireflection-coated substrate comprising a transparent substrate and an antireflection film formed on the substrate. The antireflection film comprises a multilayer film having a medium refractive index layer, a high

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refractive index layer, and a low refractive index layer successively formed on the substrate in this order. The medium refractive index layer is made of a material comprising silicon, tin, and oxygen. The high refractive index layer is made of a material comprising oxygen and at least one element selected from the group consisting of titanium, niobium, tantalum, and hafnium. The low refractive index film comprises silicon and oxygen. The antireflection film is made by successively depositing the layers by an in-line sputtering apparatus.

6. For claim 12, Applicant requires a method of producing a dust-proof substrate for a LCD panel that is used in a liquid crystal projector comprising preparing a glass substrate having a glass surface that has a surface roughness of 0.5 nm or less and forming an antireflection multilayer film. The antireflection film comprises a multilayer film having a medium refractive index layer, a high refractive index layer, and a low refractive index layer successively formed on the substrate in this order. The medium refractive index layer is made of a material comprising silicon, tin, and oxygen. The high refractive index layer is made of a material comprising oxygen and at least one element selected from the group consisting of titanium, niobium, tantalum, and hafnium. The low refractive index film comprises silicon and oxygen. The antireflection film is made by successively depositing the layers by an in-line sputtering apparatus.

7. JP '103 discloses a method of forming a multilayer stack of antireflection films on a transparent substrate [claim 1]. The film comprises a first layer with a refractive index of 1.7-1.8, a second layer with a refractive index of 2.20 or more, and a third layer with a refractive index of 1.44-1.49 [0005]. The first layer can comprise silicon, oxygen, and tin [0024]. The

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second layer can comprise titanium and oxygen [0028]. The third layer can comprise silicon and oxygen [0031]. The first, second, and third layers can be formed by sputtering [0033].

8. JP '103 does not disclose the sputtering to be in an in-line sputtering system, but does utilize sputtering.

9. Krisko discloses depositing a multilayer coating on a substrate by sputtering (abstract). The apparatus to deposit the layer is an in-line sputtering apparatus (Figure 4).

10. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of JP '103 to utilize an in-line sputtering apparatus because it is a conventional apparatus for sputter depositing multi layer films.

11. For claim 2, Applicant requires the films to be formed by reactive sputtering where the medium layer uses a target comprising silicon and tin, the high layer uses a target comprising titanium niobium, tantalum, or hafnium, and the low layer uses a target comprising silicon. JP '103 discloses the deposition to involve reactive sputtering where the target is an alloy target sputtered in an oxygen atmosphere [0034].

12. For claim 3, Applicant requires each of the films to be deposited using a plurality of targets. Krisko is described above and uses a plurality of targets to deposit each layer (Figure 4).

13. For claims 4 and 14, Applicant requires the medium layer to have a refractive index of 1.6-1.8 and a thickness of 60-90 nm, the high layer to have a refractive index of 2.1-2.8 and a thickness of 90-130 nm, and the low layer to have a refractive index of 1.4-1.46 and a thickness of 80-100 nm. JP '103 discloses the refractive index as discussed above. JP '103 also discloses the thickness of the first layer to be 60-95 nm, the second layer to be 90-125 nm, and the third layer to be 80-100 nm [claim 2].

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14. For claim 5, Applicant requires the medium layer to be $\text{Si}_x\text{Sn}_y\text{O}_z$, the high layer to be TiO_2 , Nb_2O_5 , Ta_2O_5 , and HfO_2 , and the low layer to comprise silicon oxide. JP '103 discloses the limitations as discussed above.

15. For claim 6, Applicant requires the transparent substrate to be glass with a refractive index of 1.46-1.53. JP '103 discloses the substrate to be a glass lens with a refractive index of 1.48 [0008].

16. For claim 7, Applicant requires the surface roughness of the glass substrate to be 0.5 nm or less as the center-line-means roughness Ra. The surface roughness is an obvious limitation because one of ordinary skill in the art would inherently desire to have the surface roughness as small as possible so that distortions are not present on the LCD panel.

17. For claim 9, Applicant requires the substrate to be a dust-proof substrate for a liquid panel. For claim 10, Applicant requires the panel to be for a liquid crystal projector. For claim 11, Applicant requires the substrate too be a cover glass for a solid-state pickup device. JP '103 discloses the limitations [0046].

18. For claim 13, Applicant requires cutting into the substrate of a predetermined size. The limitation is obvious. In order for the substrate to fit into a CRT or LCD, it must be a certain size. It is inherent that the substrate would need to be cut to fit the predetermined size.

19. For claim 15, Applicant requires a transmittance of 95% or more in a visible range of 430-650 nm and a reflectance of 0.5% or less in a film surface in the visible range of 430-650 nm. Figures 2-6 of JP '103 disclose the reflectance. The measurements occur at 632.8 nm [Example]. The substrate is said to be translucent and thus, the transmittance is obvious.

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20. For claim 16, Applicant requires a method of producing a cover glass for a solid-state image pickup device that comprises a glass substrate and multilayer antireflection film on the glass. The method comprises preparing the glass substrate to have a surface roughness of 0.5 nm or less. The antireflection film comprises a multilayer film having a medium refractive index layer, a high refractive index layer, and a low refractive index layer successively formed on the substrate in this order. The medium refractive index layer is made of a material comprising silicon, tin, and oxygen. The high refractive index layer is made of a material comprising oxygen and at least one element selected from the group consisting of titanium, niobium, tantalum, and hafnium. The low refractive index film comprises silicon and oxygen. The antireflection film is made by successively depositing the layers by an in-line sputtering apparatus. The method also comprises cutting into the cover glass of a predetermined size. Each of the limitations has been discussed above in relation to other claims.

Response to Amendment

21. The objection to the drawings presented in the office action mailed April 12, 2005 is withdrawn in light of the amendment.

22. The 112-second paragraph rejection presented in the office action mailed April 12, 2005 is withdrawn in light of the amendment.

23. The 103(a) rejection of claims 1 and 9-11 over JP '548 in view of Krisko presented in the office action mailed April 12, 2005 is withdrawn in light of the verified translation of the priority document.

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24. The 103(a) rejection of claims 2 and 3 over JP '548 in view of Krisko and further in view of Vossen presented in the office action mailed April 12, 2005 is withdrawn in light of the verified translation of the priority document.

25. The 103(a) rejection of claims 4-7 over JP '548 in view of Krisko and further in view of JP '208 presented in the office action mailed April 12, 2005 is withdrawn in light of the verified translation of the priority document.

Allowable Subject Matter

26. Claim 8 is allowed.

27. The following is a statement of reasons for the indication of allowable subject matter: it is neither anticipated nor obvious over the prior art of record to have a method of producing an antireflection coated substrate as claimed by Applicant in claim 8.

28. JP '103 discloses the antireflection multilayer film, but there is no conductive film between the high and low refractive index layers. Krisko does not provide any guidance on the limitation and thus does not render obvious the limitations.

General Information

For general status inquiries on applications not having received a first action on the merits, please contact the Technology Center 1700 receptionist at (571) 272-1700.

For inquiries involving Recovery of lost papers & cases, sending out missing papers, resetting shortened statutory periods, or for restarting the shortened statutory period for response, please contact Denis Boyd at (571) 272-0992.

For general inquiries such as fees, hours of operation, and employee location, please contact the Technology Center 1700 receptionist at (571) 272-1300.

Conclusion

29. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on July 11, 2005 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609(B)(2)(i). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. VerSteeg whose telephone number is (571) 272-1348. The examiner can normally be reached on Mon - Thurs (6:30 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Steven H VerSteeg
Primary Examiner
Art Unit 1753

shv
August 16, 2005